LAPAROTOMY FOR ACUTE INTESTINAL OBSTRUCTION, WITH ABSTRACTS OF 69 CASES, INCLUDING A SUCCESSFUL ONE BY THE WRITER.[1]

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THE relief of intestinal obstruction by operative measures has for centuries formed a prolific topic for professional discussion, and the procedure known to-day as laparotomy, was like enterotomy, suture of the intestines, rectal inflation and the use of emetics in these conditions, known to the Greeks, but probably rarely practiced, until brought into prominence by Dupuytren, Malgaigne and Depaul, in France, and then slowly adopted in England and other countries. The first recorded success by an English surgeon, I believe, is that of Mr. Jonathan Hutchinson, recorded in the *Med. Chir. Trans.*, so lately as 1874.

Four years later, however, at a meeting of the Medical Association at Bath, we find this surgeon strongly discountenancing early exploratory operation, and urging in its place, inversion of the patient, copious rectal enemata, and abdominal taxis, while he suggests that "in cases of uncertain diagnosis, it is better to trust to the chance of a spontaneous cure or relief by repeated abdominal taxis, than to resort to exploratory operation;" "or in desperate cases, iliac enterotomy should be done." A critic of this paper, also an advocate of non-inter-

[1]Read before the Brooklyn Pathological Society, Dec. 23, 1887.

ference,[1] says: "If this treatment failed to kill the patient it would, at any rate, should the case be doubtful, so increase the severity of the symptoms, as to place the diagnosis beyond doubt. If practiced in peritonitis or enteritis, a fatal issue might be expected. This memorandum is a terse example of that line of treatment I have characterized as the main force treatment. Mr. Hutchinson adds 'if you do not succeed at first, do it repeatedly.' How often, I should like to know, could this be done with impunity?" In the discussion which followed the reading of the above paper, prompt issue was taken with the views presented, and with its termination began a new era in the history of laparotomy. The application of antiseptic principles to abdominal surgery, and the lessons in technique to be derived from ovariotomists, also tended to inspire confidence in the mechanical treatment of intestinal occlusions, and it is for these reasons that I have limited my investigations to the operations performed in the last ten years. The list is by no means complete, but contains most recorded operations for *acute obstruction* in Great Britain, France and this country, while those which I have not been able to verify by reference to authorities in Germany, Italy and Russia, I am confident will give as good or even better results than those presented this evening.

The criticism that many unsuccessful operations remain unreported is, of course, valid, but the balance can be easily struck without weakening the conclusions drawn, I think, by the statement of the fact that the Register General of England officially reports that an average based on statistics extending over 25 years, shows an annual death rate in England and Wales of 1434 from intestinal obstructions. It has been my object in the preparation of this paper to simply draw from the cases, occurring in the time mentioned, some general inferences as to what the duty of a surgeon called to treat these cases might be, and to see whether practice, founded on the theory of early exploratory interference, stood the test of experience. According to estimates by Schramm of Krakow

[1] The Past and Present Treatment of Intestinal Obstructions.—Hugh Owen Thomas, London, 1879, p. 150.

(assistant to Miculicz),[1] based upon 190 cases, the percentage of deaths was 64.2. Previous to 1873, 73 per cent of all cases operated on died, while the best German statistics give about 58 per cent, showing a gain of 15 per cent for modern methods.

Surely in the light of this statement, it would seem as if no argument were necessary for early relief in cases otherwise so often fatal. Still, it has been my unfortunate experience to see several cases in which either the condition of the patient at the time of consultation, or the lukewarm manner in which operation was presented to the family by the medical man in attendance, negatived all possibility of relief, and in one case at least an autopsy demonstrated the ease with which aid could have been given.

ACUTE OBSTRUCTION—DEATH.

CASE I.—A young man of 25 had a severe attack of colicky pain while at a social gathering; he was taken home and suffered during that night and the following day. Toward evening his physician saw him and prescribed for simple gastralgia. By noon of the third day vomiting, which had begun on the previous morning, was decidedly fecal, and his physician suggested a laparotomy. An enema and warm bath, however, quieted all the symptoms so quickly that his fears were allayed. On the evening of the following day, however, the pain again became severe, and I saw the case. The fact that absolute constipation had now existed for five days, that the patient had suffered from peritonitis a year previously, taken in connection with the fecal vomiting, and the presence of a distended coil of intestine in his right iliac region, made me diagnosticate strangulation by band, and this in spite of the fact that his temperature was normal, and there was little tympanites. His pulse was 120, of fair quality, and his urinary secretion normal. Operation was urged and refused. The patient died on the eighth day of the attack. At the autopsy a coil of intestine protruded through the incision as soon as made, and proved to be the strangulated loop. Two adjacent coils of ileum were united by an adhesion, under which the loop had passed and become incarcerated. On cutting this across, gas passed freely into the collapsed bowel. No other

[1] *Archiv. fuer klinische Chirurg*, Bd. 30.

bands: little or no peritonitis except near affected coils, and only ℥iv of sero-pus in the abdominal cavity.

Can any one doubt that five days earlier, on the first appearance of feculent vomiting, this case could have been saved by a perfectly simple and rapid operation?

My first case in which laparotomy was accepted when proposed was the following:

ACUTE OBSTRUCTION FROM VOLVULUS.—LAPAROTOMY.—DEATH.

CASE II.—A man of about 45 had been suffering from absolute constipation for five days, when I first saw him. There had been no particular pain, and but little vomiting or rise of temperature. The pulse had averaged 80, and but little tympanites existed. Large enemata and laxatives had been given, and for the two days previous to operation, opium for peritonitis, the symptoms of which were becoming marked. On opening the abdomen a distended coil of ileum at once protruded; it was intensely inflamed and adherent to adjacent coils by masses of flaky lymph. It was so friable as to tear easily in one place under necessary manipulation; the rent which only extended into the muscular coat, was closed with two Lembert's sutures of silk. On tracing the coil downward a volvulus in the neighborhood of the ileo-cæcal valve was found, and although the intestine was twisted twice about its own axis, and firm adhesions existed, it was finally unravelled, and gas at once made its way into the gut below the seat of strangulation. A pint of stinking sero-pus was removed from the cavity, which was then irrigated with warm carbolized fluid (1/60) the peritoneal toilette made and the wound closed, a continuous catgut suture being applied to the peritoneal edges, and one of interrupted silk to the muscular flaps. The patient rallied well, but only survived one day, dying with symptoms of collapse. No autopsy could be obtained.

This case well illustrates not only the dangers of delay but the insuperable obstacles to a correct diagnosis which surround many of these cases, as here was a man suffering from a disease incurable by any but mechanical means, and yet presenting only the symptoms of a mild peritonitis. It would seem to be a marked exception to the rule laid down by Treves, that where the obstruction is complete, the pain is marked and con-

stant. One other observation of this author I have, however, found preeminently true, and that is, that nothing is more unreliable in the matter of diagnosis than the attempt to define the seat of the obstruction by the location of the pain.

Wherever and whatever the trouble may be, the umbilicus or its vicinity is the usual site referred to by the patient. Vomiting, too, which almost always accompanies the first onset of the symptoms, and is due largely to shock, may, as in the above case, be so slight as to attract but little attention, though as a rule, there is a very direct relation between its character and severity, and the completeness of the occlusion.

Any attempt, therefore, in a paper of this character to examine into the pathognomonic symptoms of the different kinds of acute obstruction would be foreign to the end which I have in view, which is simply the presentation of the cases referred to in my list, and of any inferences which may be fairly drawn from them. In most of these the usual symptoms of value were those attending ordinary strangulated hernias severe: abdominal pain, collapse, vomiting, constipation and more or less abdominal distention. In many of the fatal cases these symptoms, urgent from the first, and aggravated by the injudicious use of enemata, purgatives, abdominal taxis and delay, or masked by opium, rendered even properly performed operative measures futile, while on the other hand patients apparently moribund have been saved.

Although a few cases of foreign body have been admitted to the list, I think their use legitimate, as they were practically acute cases, having given rise to no symptoms which would place them under the head of chronic obstruction. As the mortality was 75 per cent., they certainly will not influence the statistics too favorably.

Obstruction from diverticula I have grouped by themselves, as I think they cannot, even roughly, or for clinical purposes, be classed among "bands," which differ from them in anatomy, pathology and method of treatment.

After dividing the cases under the head of intussusception, volvulus and band, a few cases still remain as unclassified.

TABLE OF CASES OCCURRING IN DECADE BETWEEN 1877 AND 1887 IN WHICH LAPAROTOMY WAS PERFORMED FOR ACUTE INTESTINAL OBSTRUCTION.

No.	Operator	Sex and Age.	History.	Date.	Result.	Authority.
1	Sands.	F., 6 ms.	Intussusception. Inflation, etc., tried. Operation 18 hours after.	March 11, 1877.	Recovered.	N. Y. Med. Jour. June, '77.
2	Creveting.	F., 21	Obstruction from omental adhesion. Operation on 14th day. Death in 4 hours.	Sept. 30, 1877.	Died.	Trs. State Md. Soc. of N. Y., 1879.
3	Cripps.	M., 18	Obstruction for 9 days. Fecal vomiting last 4. Ileum constricted by band.	Jan. 26, 1878.	"	Trs. London Clin. Soc., xi, 234
4	Lawson.	M., 23	Previous constipation for 6 weeks. Acute symptoms and fecal vomiting May 29. Op. on 6th day. Volvulus relieved, artificial anus.	June 3, 1878.	Recovered.	Brit. Med. Jour., July, 1879, i, 83.
5	Bryant.	F., 50	Peritonitis present for 3 days previous to operation, fecal vomiting for 8 hours. Gall stone removed.	Aug. 8, 1878.	Died.	London Lancet, 1879, i, 364.
6	Bellamy.	F., 34	Invagination of ileum into anterior wall of rectum. Operation on 10th day. Reduction by right hand in rectum, and left in the abdominal cavity.	Feb. 17, 1879.	Recovered.	"
7	Nancrede	M., 29	Obstruction following kick. Gangrenous peritonitis. Operation on 4th day.	Aug. 23, 1879.	Died.	Phila. Med. Times, 1879, 75.
8	Marsh.	F., 40	Obstruction from malignant stricture of the sigmoid flexure. Op. on 8th day. Artific. anus.	Oct. 15, 1879.	Recovered.	London Lancet, 1879, i. 364.
9	Boeckel.		Occlusion by band.	1880	"	Bull. et Mem. Soc. d' Chir. de Paris, '80, vi. 399.
10	Briggs.		Obstruction from intussusception.	"	"	Indiana Med. Reporter, Sept. 1880.
11	"		Obstruction from tubercular ulceration. Enterectomy and artificial anus.	"	"	"
12	"		Obstruction from pressure of an ovarian cyst. Laparotomy. Cure by drainage.	"	"	"

No.	Operator.	Sex and Age.	History.	Date.	Result.	Authority.
13	Marcy.	F., 60	Obstruction from incarcerated umbilical hernia. Operation on 3d day. Patient in extremis. Gangrenous omentum and sac removed.	1881	Recovered.	Boston Med. & Surg. Jr., 1886, 79.
14	Marcy.	F., 56	Resection of omentum and gangrenous sac of umbilical hernia, after several days obstruction. Death in two and a half days.	1881	Died.	" "
15	Estil.		Intussusception.		Recovered.	Virginia Med. M'thly, '81, 7, 556.
16	Jacobi.	F. 2 mos.	Intussusception, bloody discharge from rectum, etc. Operation eighteen hours after invasion. "Gangrene imminent."	Sept. 22, 1881.	Died.	N. Y. Med. Rec., Vol. 21, 299.
17	Arnison.	M., 54	Obstruction from rupture of aneurism of hepatic artery, causing pressure at hepatic flex. of colon, which also contained a gall stone. Operation on third day.	1881	"	Brit. Med. Jour., Dec., '81.
18	Bell.	F., 16	Obstruction treated by purgatives. Operation on 7th day. Intussusception, volvulus and constricting band. Death in twelve hours.	1882	"	Edinburgh Med. Jour., July, '81.
19	Hulke.	M.	Strangulation by omental bands, fecal vomiting. Operation on 3d day.	1882	"	Brit. Med. Jour., '82, 1, 14.
20	Sydney Jones.	M., 26	Obstruction by diverticulum from ileum, vomiting for nine days. Operation. Death in twenty-four hrs.	1882	"	Brit. Med. Jour., '82, 1, 540.
21	Halsted.	F., 35	Obstruction. Volvulus of sigmoid flexure and band. Operation on 10th day.	Dec. 19, '82.	"	Trans. N. Y. Surg. Soc., Dec. 26, '82.
22	Gerster.	M., 13	Obstruction following peritonitis, after 8 weeks. Vermiform appendix attached to abdominal wall. Death in eleven hrs.		"	" "
23	Barwell.	boy	Obstruction from diverticulum of ileum. Operation on sixth day. Death in thirteen hrs.	Feb. 5, '83.	"	Brit. Med. Jour., '83, 1, 255.
24	LeFort.	M., 18	Obstruction following peritonitis after 3 years. Operation on 7th day. Boy moribund. Band over ileum near cæcum.	June 1, '82.	Recovered.	N. Y. Med. Rec., Vol. 23, 205, '83.

No.	*Operator.*	*Sex and Age.*	*History.*	*Date.*	*Result.*	*Authority.*
25	Hulke.	M., 40	Volvulus. Operated on 4th day. Death on 3d day after.	Aug. 7, '82.	Died.	Brit. Med. Jr., '83, i. 144.
26	Sydney Jones	F., 43	Obstruction by band, 4 years after ovariotomy. Operation on 9th day of acute symptoms. Patient moribund, enterectomy and artificial anus. Death two weeks after.	June 23, '83.	"	Lancet, 1883, 818.
27	Gillette.		Int. obstruction by diverticulum. Enterectomy and artificial anus.		"	Union Medicale, '83, 36, 62.
28	Koehler.		Int. obstruction. Operation on 7th day.		Recovered.	Charitè Ann., '83.
29	Wright.	M., 42	Symptoms for 4 weeks, followed by acute intestinal obstruction. Operation on 9th day. Omental band and tumor in cæcum. Artificial anus formed. Survived twelve days.		Died.	London Lancet, '84, i. 633.
30	Stoneham.	F., 18	Obstruction, vomiting (not fecal). Operation on 4th day. General peritonitis. Volvulus.	Marc 18, '84.	Recovered.	Brit. Med. Jr., '87, 1092.
31	Blondeau.		Internal obstruction. Laparotomy.		Died.	France Medicale, '84. 1, 77.
32	Franks.	M., 47	Intussusception at ileo-cæcal valve. Man a drunkard. Operation on 6th day. Death in two and a half days.	March 4, '84.	"	Dublin Jour. Med. Sci, '84, i, 502.
33	Homans.	M., 21	Obstruction from diverticulum. Operation on tenth day. Artificial anus. Death on 7th day after.		"	Am. Jour. Med. Sci., '84, 56.
34	Bardleben.	M., 24	Int. obstruction from exudate. Incision and intestinal suture on 3d day after admission to hospital.	Aug. 17, '84.	Recovered.	Deutsch Med. Woch., '85, May 14
35	Obalinski.	M., adult.	Laparotomy for obstruction. Patient sent home well in ten days.	Sept. 19. '84.	"	Wiener Med. Press, 85, Feb. 15.
36	Savory.	F.. 53	Acute obstruction and operation on 4th day. Intestine claret color, almost gangrenous.	Jan 6, '83.	"	Brit. Med. Jour., '83, May 26.
37	Robson.	F.; 33	Obstruction and vomiting. Operation on 7th day. Intussusception. Resection of gangrenous gut. Death in twenty-four hours.	Dec. 30, '84.	Died.	Brit. Med. Jour., '85, 2, 651.

No.	Operator.	Sex and Age.	History.	Date.	Result.	Authority.
38	Polaillon.	M., 17	Obstruction caused by obliterated umbilical artery. Operation on 8th day.	July 23, '84.	Recovered.	Gazette Medicale, April 25, '85.
39	Kurz.	M., 33	Obstruction coinciding with hernia. Operation on 9th day. "Colon ensnared by ring."	Nov. 1, '84.	"	Deutsch. Woch'n. March 16, '85.
40	Obalinski.	M., adult.	Second operation nearly 4 mos. after first on case 35. Patient died from fecal extravasation due to typhoid ulceration, present but unsuspected at time of admission.	Jan. 6, '85.	Died.	Wiener Med. Presse, Feb. 15, '85.
41	Bardleben.	M., 47	Volvulus of ileum following obst. for several days. Operation on second day.		Recovered.	Deutsch. Med. Woch. May 14, '85.
42	Jeannel.	M., 53	Obstruction by band. Operation on 6th day.		"	Bull. Soc. de Chir., Paris, '85, 185.
43	Owen.	F., 3 days.	Congenital obstruction, artificial anus on third day. No search for obstruction. Death in 4 days. Band due to fetal peritonitis found at autopsy.	April 14 '85.	Died.	Brit. Med. Jour., '85, i, 1201.
44	Pugh.	M., 6	Chronic constipation. Acute obstruction. Operation on 6th day. Band divided.	July 11, '85.	Recovered.	Brit. Med. Jour., '85, 2, 392.
45	Bean.	F., 48	Constipation for two months. Operation on 3d day of acute obstruct. Enterolith, removed from ileo-cæcal junction.		"	N. Y. Med. Rec., '85, 2, 432.
46	Gersung.		Intestinal obstruction. Laparotomy.		"	Wien. Med. Woch., '85.
47	Gay.	M., 7½.	Acute obstruction following chronic. Operation on 13th day. Stricture at ileo-colic junction Death 9 days after from peritonitis.	Nov. 24, '85.	Died.	Boston Med. & Surg. Jour., '86.
48	Irish.	M., 25	Ileo-cæcal invagination. Operation on 3rd day.	July 24, '85.	Recovered.	Boston Med, & Surg. Jour., Sept. 3, '85.
49	Winslow.	F, 23	Intestinal obstruct. complicated by hydrocele of round ligament Operation on 7th day. Ileum attached for 6 inches to Douglas's pouch. Freed by tearing.	Dec. 8, '85.	"	Am. Jour. Med. Sci., '86, i, 411.
50	Rockwell.	M., 60	Obstruction from volvulus. Operation on 5th day. General peritonitis, and suture of torn intestine. Death in 24 hrs.		Died.	N. Y. Med. Jour., Feb. 20, '86.

No.	Operator.	Age and Sex.	History.	Date.	Result.	Authority.
51	Westbrook.	M., 19	Acute obstruction from multiple adhesions. Operation on 7th day. Death in 11 hrs. Intestine gangrenous and perforated.		Died.	N. Y. Med. Jour., '86, i, 207.
52	Pilcher.	F., 29	Intest. obstruct. due to adhesions between ovary and mesentery. Operation on 11th day. Patient moribund. Transfusion (saline). Death immediately following.		"	" "
53	Roehler	M., 23	Intestinal obstruction from band. Operation on 7th day.	1886	Recovered.	Berlin Charité Annals, x, 486.
54	Wes .		Acute obstruction. Laparotomy. Peritonitis present.		"	N. Y. Med. Jour., '86, i, 166.
55	Lange.	F., 60	Obstruction from concretion. Operation on 4th day. Peritonitis present. Death in 11 hrs.	Sept. 19, '85.	Died.	N. Y. Surg. Soc. Trans., Dec. 22, '85.
56	Barker.		Acute intestinal obstruct. followed by general peritonitis.		Recovered.	Trans. London Clin. Soc., 86, 149.
57	Barnhill.	F., 65	Obstruction following ovariotomy. Operation 5 weeks after, adhesions divided.	Aug., '86.	"	Phil. Med. Register, '86, 2, 416.
58	Williamson.	M., 22	Acute obstruction, fecal vomiting. Operation on 14th day. Two bands divided.	Aug. 27, '86.	"	Brit. Med. Jour., '87, i, 1092.
59	Jamieson.	M., 42	Obstruction lasting 2 days. Laparotomy.	Sept. 5, '85.	"	Brit. Med. Jour., '87,, i 568.
60	Wylie.	F., 50	Obstruction from band over ileum Operation on 3d day. Intestines chocolate color.	Oct. 9, '86.	"	Am. Obst. Jour., July, '86, 1259.
61	Wyeth.	F., 56	Obstruction from incarceration of loop of intestine in groin. Temporary operation in groin on 6th day. Laparotomy on 19th day, with resection of 2½ inches of gangrenous gut.	Oct. 9, '86, & Oct. 22, '86.	"	N. Y. Med. Jour., '87, 15, 309.
62	Bond.	22	Int. obstruction. Operation on 5th day and band of jejunum divided. Rupture of gut, artificial anus made. Enterectomy Feb. 16.	Jan. 7, '87.	"	London Lancet. '87, i, 728.
63	Barker.		Intussusception from neoplasm. Excision of growth, suture of cut ends of intestine.		"	Proc. of Royal Med. & Chir. Soc., London, '85-7, 2, 256.

No.	*Operator.*	*Age and Sex.*	*History.*	*Date.*	*Result.*	*Authority.*
64	Pugh.		Internal strangulation. Laparotomy.		Died	Liverpool Med. Chir. Jour.,' 87, 7, 734.
65	Knaggs.	M., 5½.	Intussusception. Operation on 3d day. Intestine through ileo-cæcal valve. Irreducible and gangrenous. Death in 1 1-2 hours.	1887	"	Lancet, '87, i, 1124.
66	Cheever.	M., 23	Volvulus of ascending colon and unattached cæcum. Death in 3 hrs.		"	Boston Med. Jour., '87, 17, 7.
67	Gay.	M., 14	Operation done for recent adhesions of intestine to abdominal walls, producing symptoms from which patient was sinking.	1887	Recovered.	Boston Med. & Surg. Jour., '87, 16, 25.
68	Rockwell.	F., 35	Obstruct. from band 1 year after peritonitis. Operation on 4th day.	Nov. 14, '87.	"	
69	Wight.	M., 22	Obstruction from band, following peritonitis 7 mos. previous Op. on 5th day. Two large bands divided. Intestine 1 flamed. Death in 3 days.	Nov. 17, 87.	Died.	Personal communication.

Dividing these cases into groups, according to their cause, we have :

Intussusception,	11
Bands or adhesions,	24
Volvulus,	7
Biliary or intestinal calculi,	4
Diverticula	4
Unclassified	19
	69

Of these same classes the results of operations were as follows :

	Recoveries.	Deaths.
Intussusception,	6	5
Bands or adhesions,	14	10
Volvulus,	3	4
Biliary or intestinal calculi,	1	3
Diverticula,	0	4
Unclassified,	13	6
	37	32

This gives a mortality of 46 per cent., or a gain on the statistics previous to 1873 of 27 per cent, and this in spite of the fact that nearly two-thirds of the fatal cases were operated upon at a time or under conditions which would almost necessarily preclude successful results.

So far as I can judge from the titles or abstracts of cases omitted from the above list, the result of tabulating them would be a still stronger argument for early laparotomy. Of course statistics can give but a slight approximation to results even in cases submitted to operation, since many of the unsuccessful ones are never heard of, but in view of the terrible mortality in unrelieved cases, and the increasing success attending surgical interference, anything which promises a chance of recovery is better than what Bryant has sarcastically characterized as the "Surgery of Hope." And yet those who opposing early laparotomy as an unwarrantable interference with natural methods of relief, treat their patients upon this basis, seem guilty of the most startling inconsistencies. A curious example of this was seen in the report of a case presented to the London Clinical Society in 1879. Here the essentials of treatment consisted in daily enemata, hot fomentations, turpentine, croton and castor oil, the passage of rectal tubes, inversion of the patient and shaking her while in this position, kneading and manipulating the abdomen, galvanism, puncture of the bowels with a trocar, the internal use of extract of aloes, and a combination of enemata and kneading, and when the patient, with a meekness and endurance characteristic of her sex, obligingly lingered along until the fifty-ninth day, it is calmly announced that her death was sudden and unexpected.

In the discussion which ensued, no marked protest was made against the mode of treatment in this case, in fact some of the most objectionable features are still advocated by high authority, and it is this which makes the efforts at operative relief so unsuccessful, when applied as a *dernier ressort.* Certainly, no properly performed laparotomy could have inflicted upon this patient injury at all comparable with those just enumerated. As bearing upon the point now under discussion, I have run over the histories of the 32 fatal cases reported in my list, and find that of that number 20 were operated upon after

the third day, or were *in extremis* at the time of operation. Assuming that if operated upon before abdominal distention, inflammation and exhausted strength had enormously diminished their chances, they would have recovered, as similar cases in the same list did, we should have had the percentage of successes increased to 83 per cent. The assumption is not a strained or unfair one, as cases 6, 13, 16, 24, 49, 61 and 63 abundantly prove, and reference to any list of modern abdominal operations will confirm. I am, of course, aware that in many, perhaps most, of these cases the diagnosis is obscure or impossible, and believe that operative methods should be resorted to only when certainty or strong probability of obstruction exists, but surely in the few hours or days spent in coming to a definite conclusion as to the diagnosis, the patient can be spared the infliction of such harmful measures as those cited above. The time can be profitably occupied in a careful study of obscure points in the given case, in the administration of just enough morphia subcutaneously to control the shock always present in true obstruction, and to relieve pain, while at this time all food should be withheld if vomiting is present, and the patient sustained by small nutrient enemata, such as peptonized milk, while water to relieve thirst can be given in the same way, as I have proved after several ovariotomies and abdominal operations. Ice to suck, and perhaps the belladonna administered internally, as suggested by Dr. Kerr and other English writers—who believe that in some forms of obstruction its use, in doses of two grains every hour, is often preferable to opium—should be the only substances introduced into the stomach. At this point in a case, if the propriety of operating is doubtful, that of withholding all purgatives is not. Enemata, administered by gravity, can be made to carry such substances as ox gall, glycerin and oil well up into the intestine in some cases, and certainly are less harmful than air and carbonic acid, from the use of which several fatal cases have been reported. If the obstruction be from fecal impaction, or even intususception, a cure may follow their use, as I have had occasion to prove in my own practice, in the case of a little girl of 2 years, who was relieved in less than an hour of an intussusception of the colon which had lasted over a day when

I first saw her. By adoption of such a plan of treatment as this the patient is at least kept in a condition favorable for spontaneous recovery in some forms of invagination and strangulation, and his powers conserved for repair if operation be decided upon. If, however, the symptoms persist, the diagnosis being still obscure, what are the indications and time for surgical relief? To these questions I cannot give a better answer than by quoting the argument of a recent writer on the subject, which seems to me absolutely convincing.[1]

"To cases of acute obstruction there is practically but one termination—death. No case of volvulus, whether of large or small intestine, has as yet been known to recover under treatment purely medicinal. Spontaneous recovery, in the numerous class of cases of strangulation by bands is not to be looked for. In the case of intussusception, where we have been accustomed to look for favorable results without operation, it seems to me that Treves has made out a clear case against expectant treatment. Looked at from the side of causation or actual pathological condition, there is, practically, no expectation of recovery. Certainly ninety-five per cent of all such cases die.

Here, then, the indication is clear enough—as clear as the indication to tie a bleeding carotid—operation. In the sense of avoiding the risk of death, the indication is more definite than in external hernia; for in hernia there is a chance of recovery by gangrene. In the sense of promoting the chances of recovery, the indication is not so strong; for more cases of external herniotomy must always recover than of internal.

The risks are increased in the same way by waiting, and by handling or purgation, which are almost the same in evil effect. There is but one treatment—release the strangulated bowel from the strangulating band."

"At once, or within a few hours, we ought to make a definite diagnosis. If we are convinced that it is acute obstruction, then an operation should be performed at once; if we are convinced that it is not, another treatment equally definite ought to be pursued. From the beginning a definite plan of

[1]Abdominal Surgery, J. Greig Smith, London, 1887, p. 372.

treatment ought to be laid down and adhered to. Let it be either drugs or operation, and never that fatal compromise—operation when drugs fail."

As the choice and method of operation are purely surgical topics, and could be made to occupy an entire evening of themselves, I will confine my remarks on this point to running rapidly over what from reading and experience I deem to be the most practical means of arriving at the relief of the conditions present. The incision having exposed the dilated intestines it is a rule to which there are few exceptions that the coils first appearing at the opening are those most distended, and consequently intimately connected with the constriction, following them in the direction of increasing size and congestion or discoloration will generally lead at once to the obstructed point. Failing in this, the whole hand should be introduced and search gently made for the affected point. If necessary, the distended coils can be removed from the cavity, laid on flat sponges, and protected by warm aseptic flannels.

If very much distended they should be carefully incised transversely to their axis, and being held over a vessel at a proper distance from the incision, emptied of their contents, gaseous and feculent. When sufficiently emptied, the intestinal incision should be closed with a continuous silk or catgut suture, and returned.

Volvulus should be, if possible, untwisted and returned; the plan just spoken of in the treatment of distended intestine is applicable also to volvulus, and may render its unraveling easy, when otherwise impossible. Failing to reduce the twist, an artificial anus should be made at the nearest convenient point above the gut, or resection of the gut made, the latter method being extremely doubtful.

In *Intussusception*, if early laparotomy has been done, the chances for simply reducing the invagination are excellent, as in Sands' celebrated case. A delay of two days, especially in the young, may prove sufficient time for adhesive processes to have occurred which may render all attempts useless. In such cases Nelaton's operation for artificial anus should be made, or resection of the gut done, with formation of an artificial anus, or resection with suture of the divided ends. The operations

are of value in the order named, the first being applicable to most cases, and available where neither of the others is, though all are followed by large mortality.

In *Obstruction* by *bands* or *diverticula*, the constricting mass should be divided between two ligatures if solid, the ligature being tightly knotted near the intestine, or in cases of large solid adhesions transfixing the band near the intestine. Search should always be made for other adhesions near the one causing the obstruction, as they are often multiple, as in the case which closes this paper.

In intestinal diverticula which are connected with the lumen of the gut, the best plan of treatment would probably be that suggested by Smith. This consists in pushing inward the mucous membrane after division, and ligaturing the fibrous coat outside it. The treatment of other conditions often found in these cases must be left to the individual judgment of the surgeon, guided by the laws of modern abdominal surgery, always remembering the dictum of the writer already quoted that "A man who enters the abdominal cavity ought to be able to do anything, from ligature of a vessel to resection of the intestine; and he ought to be prepared to do this in a manner which defies the criticism of his brethren."[1] I cannot close this paper more appropriately than by giving a brief history of a recent case in which the application of the principles here enumerated was the direct means of saving a valuable life, otherwise most certainly doomed.

ACUTE OBSTRUCTION FROM BAND.—LAPAROTOMY.—RECOVERY.

CASE III.—Mrs. K. A., 41, was seized at 1 A.M., on the morning of Nov. 10, 1887, with a slight colicky pain in the region of the transverse colon, this gradually increased in severity, and was followed by vomiting of partially digested food from meal of previous evening. Under the influence of one-fifth grain of morphia given by her husband (a physician), the pain subsided, and a quiet interval of a few hours ensued. The pulse and temperature were about normal at 7 A. M., when an enema was given, bringing away a small amount of softened fæces. Another one-fifth of morphia was given, under which the patient was again comfortable for three hours.

[1]Smith, loc. cit., p. 73.

For the following three days the patient remained about the same; little or no tenderness of the abdomen, tympanites or increase of temperature; no nausea or vomiting, except on attempting to take food. Enemata were given repeatedly and carried high into the bowel by a long rectal tube, but little or no fecal matter came away. Morphia was continued in doses of one-fifth grain every three hours. On the evening of the 12th a severe attack of pain came on, requiring large doses of morphia to control it. Dr. J. A. McCorkle now saw the patient, and suggested the use of small doses of gelseminum, with a view to controlling a possible enteralgia, and also citrate of magnesia on the following morning. Under this treatment and morphia the patient passed a fair night, but rejected the laxative soon after taking it.

Nov. 13th.—Once or twice during the day a little egg-nog was swallowed, but at 3:30 P. M. vomiting again began, and soon became stercoraceous. The diagnosis of obstruction was now made, and I was asked to see the patient at at 9:30. I found her siting up in bed, complaining of little or no pain, pulse; 100, temperature, 99°. She located the obstruction in left iliac fossa, said she had dreaded some complication of the kind ever since a severe attack of peritonitis in 1886, and begged for an exploratory operation at once. An O'Beirn tube was now introduced (with the patient *a la vache*) to a depth of 14 inches, and an enema of oxgall and glycerine given, but with no result.

Examination per vaginam throwing no light on the case, morphia was again given, under which the patient passed a comfortable night.

Nov. 14.—At 11 A. M., with the assistance of Dr. McCorkle, Fowler and George R. Westbrook, laparotomy was done as follows. The abdomen having been thoroughly cleansed with mercuric biniodide, and the field of operation surrounded with towels sterilized in the same solution, an incision was made from the umbilicus to the pubes, through which distended coils of intestines at once protruded. These were followed in the direction of greatest discoloration and congestion, until a point was reached at which a constricting band could be identified.

This was no easy matter, as the swollen coils took up so much room, that I was finally obliged to remove about twelve feet of them from the cavity, and laying them carefully on large sterilized sponges, cover them with warm aseptic flannels, and commit them to the care of an assistant. Though the band could now be plainly felt and seen, it lay at such a depth that I was obliged to prolong the incision through the umbilicus two or three inches more before I could reach it to divide it. The distended coils were of a deep plum color in the vicinity of the

stricture, but had not yet quite lost their polish, and, as I gently drew them out of the abdomen, the serous surface of the one nearest the constriction gave way and bled slightly. From this fact I argued the propriety of returning them, without an enterectomy, and having closed the tear with three Lembert sutures of silk, and ligated two or three bleeding points in the mesentery with catgut, I divided the band between two silk ligatures, and withdrew the strangulated loop from the abdomen. As it filled with the gas from adjacent coils, it seemed in quite as good condition as the gut in its vicinity. The constricting band ran from one coil of the ileum to another, lying parallel to it, and was about an inch long. Under this the obstructed loop (about 14 inches in length) had become entangled. About 12 inches higher up on the same two coils of the ileum was another band, about one and three-fourths inches in length, which was also divided, to prevent future mischief. Although the distended coils outside the abdomen were with difficulty returned to the cavity, I thought best to avoid further shock, which would certainly follow an enterotomy for their relief, and accordingly I rapidly cleansed the peritoneal cavity, and closed the wound with interrupted silk sutures. A dressing of iodoform and paper wool was applied, and the patient put to bed, having been under ether a little over an hour. The patient rallied well, but soon began to complain of severe pain about the umbilicus, which was quieted at 5 : 30 by ℥x Magendie hypodermically, the pulse falling from 120 to 84. This pain was probably due, in a large measure, to the sudden influx of blood to the vessels of the strangulated loop, as from this time no further symptoms of the kind appeared.

Nov. 15.—Patient is taking ℥ss of hot water every half hour. No pain till early this morning; easily quieted by ℥v Magendie; temperature, 100 1/5°, pulse, 84; passing large amounts of flatus through rectal tube, and lying on left side. Towards evening a slight fecal movement occurred, and the temperature fell to 99 1/5°. Slept four hours without opium.

Nov. 16.—Perfectly free from pain. Abdomen subsiding so rapidly that rearrangement of bandage is necessary; temperature, 99°, pulse, 84. Tongue clean and moist. Small amounts of peptonized milk given at short intervals, alternating with beef juice.

Nov. 17.—Had food at 3 A. M., after a fair night's rest, and slept again until 7. Is free from pain, and eager for food. Took during the 24 hours Ojss clam broth; same amount of peptonized milk and Oj champagne.

Nov. 18.—Patient has slept well, but this morning complains of great flatulence. A rectal tube worn during the day, and the patient's

position changed to the side; large quantities of gas discharged by this means.

Nov. 21.—To-day bowels were moved for the first time by a glycerine and ox gall enema. An enormous evacuation, completely filling the bed pan, was the result.

Nov. 23.—For two days has been sitting up a little in bed. The bowels have been moved each day by enemata, and the diet has been increased by the addition of farinaceous food and milk, with raw oysters and champagne.

Nov. 24.—The patient complained of severe pain in the back, yawning and wandering pains in the limbs, followed by slight fever. These symptoms were succeeded by a chill on the next morning, and yielded in a few days to quinine. With this exception the patient's further progress to recovery was uninterrupted. The stitches were removed Nov. 25, the wound having healed under one dressing.

So far as I can learn, this is the first successful case of laparotomy for acute intestinal obstruction in this city.

AN EXPERIMENTAL CONTRIBUTION TO INTESTINAL SURGERY WITH SPECIAL REFERENCE TO THE TREATMENT OF INTESTINAL OBSTRUCTION.[1] (CONTINUED.)

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II.—ENTERECTOMY.

IT still remains an open question to what extent resection of the small intestines can be performed with impunity. It is true that Koeberlé, Kocher and Baum, have successfully removed respectively 2.05m., 160ctm., and 137 ctm. of the small

[1]Read in the Surgical Section of the Ninth International Medical Congress, Washington, September 5.